

Flammarion, Camille.

L'été de la Saint-Martin. Bulletin de la Société astronomique de France, Paris, 28, 1914, p. 487-490.

Analysis of temperature records for Juvisy (near Paris), 1901-1914, showing that the temperature does not tend to rise at the time of the November meteor shower (Leonids), November 14-17. There is also no recurrent rise of temperature on November 11 (St. Martin's day). Suggests that pictures of St. Martin sharing his cloak with a poor man may have given rise to the tradition concerning the weather of St. Martin's day.

Meissner, Otto.

Existieren die "Eisheiligen"? Wetter, Berlin, 31, 1914, p. 176-179. Records for Swinemünde, on the Baltic coast, 1898-1910, show a maximum frequency of NE. winds on May 10 (ice saints) and May 20-25 (little ice saints).

Schmidt, Albert.

Die Anomalien des jährlichen Temperaturganges und ihre Ursachen. Jahrbücher des Nassauischen Vereins für Naturkunde, Wiesbaden, 67, 1914.

The author points out that temperature irregularities in the spring, when the "normal" temperature curve has a steep ascent, and in autumn, when it has a steep descent, are more likely to be smoothed out in the mean curve deduced from a long record than the irregularities of summer and winter, where the "normal" curve is approximately horizontal. This accounts for the greater prominence of the cold period in June as compared with those of April and May. He also shows that it is illogical to speak merely of abnormal falls of temperature in spring and abnormal rises of temperature in autumn, ignoring rises in spring and falls in autumn. The cause of the irregularities is found chiefly in the seasonal (semiannual) changes in great centers of action, and the irregularities are therefore most pronounced at the transition periods (spring and autumn) and over central Europe (lying between oceanic and continental regions of climate).

1915.

Hann, Julius von.

Lehrbuch der Meteorologie. 3d ed., Leipzig, 1915. See pages 102-104. Handy digest, with references to the principal literature.

Talman, C. F.

Indian summer. U. S. Weather bureau, Monthly weather review, Washington, 43, 1915, p. 44-45. Deals with name only.

1916.

Ware, H. E.

Notes on the term Indian summer. Publications of the Colonial society of Massachusetts, Cambridge, Mass., 18, 1916, p. 123-130. Deals with name only.

Reed, W. G.

Indian summer and Plimsoll's mark. U. S. Weather bureau, Monthly weather review, Washington, 44, 1916, p. 575. Deals with name only.

1917.

Arctowski, Henryk.

Normal anomalies of the mean annual temperature variation. London, Edinburgh and Dublin philosophical magazine and journal of science, London, (6) 33, 1917, p. 487-495.

The author finds that the irregularities in typical curves showing the annual march of temperature at stations throughout the world are steplike, as if the station had been shifted to a warmer or colder climate, or they are changes to a curve of larger or smaller amplitude, corresponding, respectively, to a continental or a marine climate. He also points out the "intimate relationship between very far distant stations," and concludes "that in a comparative study of the anomalies of the annual temperature variation, Teisserenc de Bort's conception of the great centres of action of atmospheric circulation will find an extensive application, because, although at present it would be premature to try to explain why it is that some changes of phase may occur simultaneously in Arctic and Antarctic regions, or in North America and Siberia, it seems impossible to conceive such correlations without supposing some relationship with the exchange of pressure between the seasonal and permanent centres of action."—p. 495.

Ryd, V. H.

On the computation of meteorological observations. Kjøbenhavn, 1917. (Publikationer fra det Danske meteorologiske Institut. Meddelelser Nr. 3.)

Chapter 7. Secondary minima and maxima in the annual variation of the temperature, p. 40-45. Criticizes the views of Dove and others as to the reality of the supposed recurrent cold period in May and other recurrent irregularities. If these are not real features of the climate they will gradually disappear as the period of observation grows longer. A comparison between the summer temperature curve at Copenhagen based on a record of 124 years and one based on a period of 25 years shows how the anomalies tend to be smoothed out in the longer record. The author also shows that the annual march of temperature may be accurately represented by a curve based on five-day means, according to a method of adjustment which he describes.

Forbes, W. E.

Ice saints. Annals of the Astronomical observatory of Harvard college, 83, pt. 1, Cambridge, Mass., 1917, p. 53-59.

Analysis of a temperature record kept at New Bedford, Mass., 1813-1905, shows no definite recurrence of heat or cold about May 10. An instructive diagram shows the variability from year to year of the mean temperature for each date from May 7 to May 15.

RAINSTORM OF AUGUST 13-14, 1919, ON MARYLAND-DELAWARE PENINSULA.

By A. H. THIESSEN, Meteorologist.

[Dated: Baltimore, Md., Sept. 24, 1919.]

A rain and wind storm of unusual severity occurred on Wednesday, August 13-14, 1919, over the entire Maryland-Delaware Peninsula, resulting in immense damage to agriculture, roads, and bridges, and was the indirect cause of injury and death to several persons.

The morning weather map of August 13, 1919, showed a disturbance central off the Virginia coast moving northward, and the forecaster at the Central Office, Washington, D. C., ordered southeast storm warnings for the Atlantic coast from Delaware Breakwater to Boston. Rain began on the north Virginia coast about midnight of the 12th, and as the storm moved north the rain became general by 8 a. m. over the entire peninsula. At times it fell in torrents, but gradually diminished in intensity toward the end of the afternoon of the 13th, when it ended in the southern portion of the peninsula, but continued until early morning of the 14th in the northern portion. Heavy gales attended this rain, and the following maximum velocities were reported: 50 miles an hour at Norfolk, Va.; 60 on the beach at Atlantic City, N. J.; 35 at Cape May, N. J.; and 62 at Cape Henry, Va.

It is the general opinion that the destruction of property and crops was made easy due to the previous wet condition of the land, which was true, as very little loss

of substantial buildings was reported, although numerous outbuildings and large shade and fruit trees were blown down or torn up by the roots, indicating that the anchoring was poor. The damage resulting from this storm was enormous and was variously estimated, but two or three million dollars would probably cover all material damage.

All standing crops were blown or beaten down to a greater or less extent. Corn was first blown down one way, and then when the wind changed was blown the other way and broken off, the tassels were whipped off and the blades shredded. Blossoms on late crops were blown from the plants, especially beans and tomatoes. Fruit trees were stripped of pears, peaches, and apples. Fields of tomatoes, cabbages, and potatoes were flooded, and truck in general was damaged by the wind and excessive rain. Wheat in the shock suffered, as it could not be moved, due to the miry condition of the ground. Potatoes just planted were a total loss. Many shade and fruit trees were split or blown to earth. Losses of cows, pigs, and poultry due to drowning were not inconsiderable.

Houses were injured by the wind driving in rain and thus damaging ceilings and walls. Milldams gave way and besides being a loss in themselves caused additional loss

by adding small floods, making washouts all the more easy. Telegraph and telephone lines were either blown down or were broken by trees falling against them. Traffic was suspended on the railroads for two days in places, due to weakening of the roadbed, dangerous bridges, and lack of communication. Roads were badly washed, wooden bridges were carried away, and concrete bridges were greatly weakened and some collapsed.

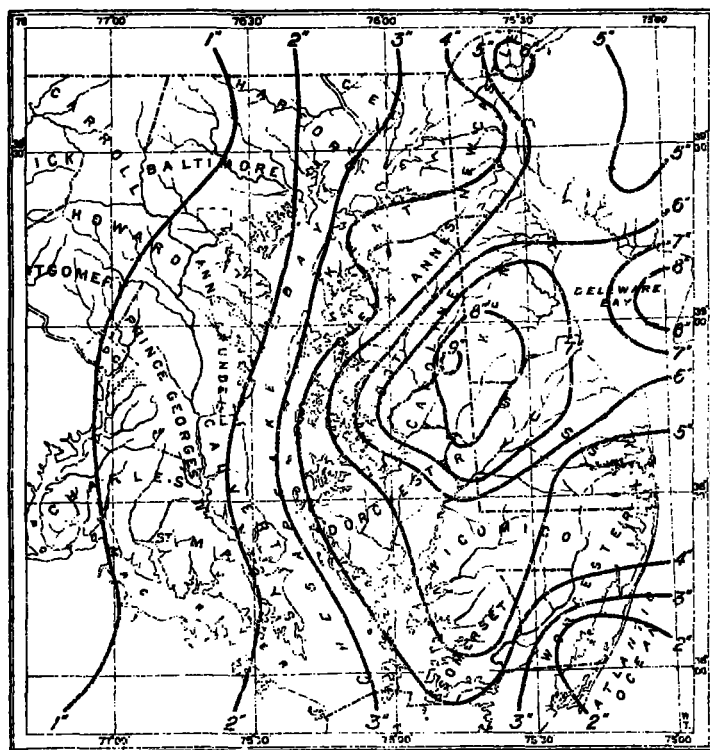


FIG. 1.

A washout near Denton, Md., caused the wreck of a work train, in which one person was killed and four injured. Two men were drowned on two barges which broke away from their moorings and sank in Delaware Bay. Another man was drowned by the foundering of a dredge at Port Penn, Del.

The accompanying chart shows the precipitation from this storm. It appears to have been greatest in the central portion of the peninsula, while very large amounts fell in northern Delaware and southern New Jersey.

WATERSPOUTS ON LAKE ERIE, AUGUST 19, 1919.

W. J. Willoughby, master of the steamer *Fleetwood*, reports having seen two waterspouts on August 19, 3 or 4 miles from the Buffalo breakwater. The *Fleetwood*, westward bound, left Buffalo at 7 a. m. of that date. When about a mile out from the breakwater a heavy rain squall was encountered. The squall (west wind) lasted about 20 minutes. "When it cleared away I noticed south of us about a mile some mist like steam on the water. [I] took the glasses to look at it but could not make much out of it. Shortly after this I noticed a thin spiral cloud drop down and connect itself with the white mist that looked like steam. It got bigger until it looked like the trunk of a large tree and I recognized it as a waterspout. Another formed about one-half mile away from the first.

I noticed them for some time when we lost sight of them. They were the first I have ever seen on the Lakes, and I have been sailing for about 30 years."

HOT SQUALL AT MIAMI, FLA., MAY 6, 1917.

A wind squall, attended by unusually pronounced pressure fluctuations and a remarkable rise in temperature, occurred shortly after 6 a. m. An extreme wind velocity of 52 miles per hour from the southwest was recorded at 6:21 a. m. The temperature rose from 71° (F.) at 5 a. m. to 88° at about 6:25 a. m., the last 10° of the rise occurring within a period of a few minutes. It

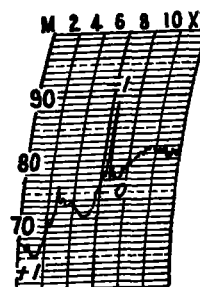
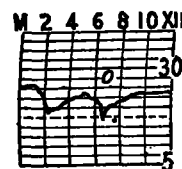
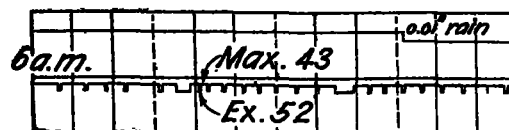


FIG. 1.—Tracings from wind, temperature, and pressure records, Miami, Fla., May 6, 1917.

then as suddenly fell to 77°. The temperature of 88° was considerably higher than had ever been recorded at this station at so early an hour. See fig. 1.

A thunderstorm occurred at Miami during the night of the 5th-6th, but it ended between 1 and 2 a. m. The barograph trace shows that there were abnormal pressure fluctuations following the thunderstorm and preceding the squall, indicating decidedly unstable conditions. An examination of the weather map of May 6 shows a moderate depression off the southeast Florida coast, forming part of a trough of low pressure extending along the Atlantic coast to southern New England. This, of course, was a favorable condition for thunder squalls, and thunderstorms were reported on that morning from all Weather Bureau stations on the Florida and east Gulf coasts, with the exception of Jacksonville.

There was no rain in connection with the hot squall, and none immediately preceding or following it. All regular and cooperative stations in southern Florida, however, reported rain on the 6th, the amounts being generally light. I have no means of ascertaining the time of occurrence of these rains. The sky at Miami during the early morning and the forenoon of the 6th was covered by St. Cu. clouds.

The sudden and phenomenal rise in temperature must have been caused by air that had been forced downward and heated adiabatically, but why the sudden and decided fall in pressure, instead of a rise, as occurs with the forward and downward rush of air from a thunderstorm? It is difficult to reconcile a strong descensional wind, such as must have occurred, with a simultaneously falling barometer.

The fall of pressure with this hot squall, however, corresponds to the rise in pressure attending cold squalls. I have never known the outrush of air from a thunder-

storm to fail to lower the temperature, regardless of whether the storm was or was not attended by rain.—*R. W. Gray.*

A HILLTOP FOEHN.

On the summit of Great Blue Hill (195 m. high) near Boston; Mass., May 6, 1913, immediately following a thunderstorm, in fact, three-quarters of an hour before the thunder ceased, a northwest wind of moderate force brought an almost instantaneous rise of temperature from 61° to 78° F., and an equally rapid fall in humidity from 100 per cent down to 20 per cent. These conditions persisted with minor interruptions (when temporary shifts of wind to the southwest put the temperature down 10° or so) for four hours, 10:20 p. m.-2:20 a. m. This extraordinary free-air foehn took place exactly in the center of a weak cyclone. At the base station, 118 meters below the summit of the hill, the maximum temperature was but 68°F.—*Charles F. Brooks.*

RELATION OF CLOUDS TO WEATHER IN CENTRAL OHIO.

By HOWARD H. MARTIN, Observer.

[Dated: Weather Bureau, Columbus, Ohio, Aug. 25, 1919.]

SYNOPSIS.—It is the object of this paper to present as fully as possible the relation existing between the appearance of the various cloud forms and the subsequent changes in weather and temperature. To this end, a total of 5,037 observations at Columbus, Ohio, have been considered, covering a period of 10 years, 1909-1918, inclusive. A comparison of the prognostic values of cloud indications as observed at Columbus with those determined for San Francisco (1) will give the reader, at a glance, the salient differences existing between the marine and the continental types of climate, as shown by varying cloud forms.

Cirrus.—It is well known that cirrus attains the greatest altitude and the greatest velocity of all cloud forms. It has been regarded by tradition and adage as the first indication of approaching storm. With regard to this, Mr. Palmer says:

Though cirrus and cirro-stratus clouds are apparently at times associated with anticyclones, they are typical accompaniments of cyclones. If a longitudinal section were made through the vertical axis of a typical cyclone and parallel to its direction of progression, the cirrus and cirro-stratus sheet forming the topmost portion would extend forward from the center a long distance and backward a shorter distance. In the sequence of events which usually precede cyclonic precipitation, clouds of this kind are ordinarily the first sign, often occurring many hours before the barometer begins to fall or before any other indication of the approaching storm makes its appearance.

TABLE 1.—Weather conditions following cirrus clouds.

Clouds moving from—	Number of cases.	Precipitation followed—			Temperature changed within 24 hours.		
		Within 12 hours.	Within 24 hours.	Within 48 hours.	Less than 6°.	6° or more warmer.	6° or more colder.
April to September:		<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>
N.....	32	0	0	13	100	0	0
NE.....	23	0	52	54	46	54	0
E.....	2						
SE.....	1						
S.....	1						
SW.....	14	0	0	0	22	0	78
W.....	94	12	45	56	53	23	24
NW.....	44	29	29	29	57	0	43
For season.....	211	12	33	46	56	18	26
October to March:							
N.....	12	0	0	83	25	75	0
NE.....	11						
E.....	23	52	52	61	30	61	0
SE.....	11						
S.....	12	0	0	0	25	0	75
SW.....	23	61	61	61	18	43	30
W.....	34	65	70	70	71	0	29
NW.....	61	18	52	70	22	78	0
For season.....	190	32	45	58	47	44	19
For the year.....	401	21	38	50	48	30	22

¹ A. H. Palmer, Clouds and their significance in local weather forecasting. MONTHLY WEATHER REVIEW, 1918, (46): 406-413.

Table 1 is a summary of the weather conditions following cirrus clouds observed at Columbus during the 10 years of observation. All cirrus clouds covering 0.1 or more of sky at time of observation are included in the table which embraces 401 cases. The weather following is computed in terms of the per cent of frequency of occurrence. As Mr. Palmer points out in his paper, high clouds can necessarily be observed only when unobscured by lower clouds, but it does not seem probable that, even were it possible to secure data of these clouds when so obscured, the final results would be altered to any extent.

It will be noted from Table 1 that cirrus clouds moving from a westerly or northwesterly direction are far more indicative of precipitation than from any other quadrants, excepting perhaps the northeast, where for a limited number of observations a rather high prognostic value was obtained, during the summer months, and from the north, during the winter months. Subsequent temperature changes exceeding 6° were more frequently positive during the winter months and negative during the summer, although for the year as a whole they were well divided. With the exception of movements from the directions noted above, cirrus was found to have a low prognostic value for Columbus. For a limited number of observations, (26) during the 10 years of cirrus moving at high velocity 76 per cent were followed by precipitation within 48 hours, whereas with no apparent movement 33 observations gave a prognostic value of only 26 per cent.

Cirro-stratus.—Table 2 reveals the fact that cirro-stratus, present at what might aptly be termed the secondary stage of cyclonic approach, is, when moving from a westerly direction, a rain prognostic of comparatively high value, especially during the winter months.

During these months, too, the appearance of such clouds is usually followed within 24 hours by a marked temperature change, exceeding 6°, a change of this character following 64 per cent of the 151 observations, regardless of cloud direction. When, during the winter, cirro-stratus approached from the southwest the value was considerably enhanced, 87 per cent of the 33 observations being followed by a pronounced change. Dur-